

Abstract

The present invention relates to a process for preparing optionally alkyl-substituted 1,4-
5 butanediol by two-stage catalytic hydrogenation in the gas phase of C₄-dicarboxylic acids
and/or of derivatives thereof having the following steps:

a) introducing a gas stream of a C₄-dicarboxylic acid or of a derivative thereof at from
200 to 300°C and from 10 to 100 bar into a first reactor or into a first reaction zone
10 of a reactor and catalytically hydrogenating it in the gas phase to a product which
contains mainly optionally alkyl-substituted γ -butyrolactone;

b) introducing the product stream obtained in this way into a second reactor or into a
second reaction zone of a reactor at a temperature of from 140°C to 260°C and
15 catalytically hydrogenating it in the gas phase to optionally alkyl-substituted 1,4-
butanediol;

steps a) and b) being carried out at the same pressure;

20 c) removing the desired product from intermediates, by-products and any unconverted
reactants;

d) optionally recycling unconverted intermediates into one or both hydrogenation
stages,

25 said hydrogenation stages each using a catalyst which comprises $\leq 95\%$ by weight,
preferably from 5 to 95% by weight, in particular from 10 to 80% by weight, of
CuO, and $\geq 5\%$ by weight, preferably from 5 to 95% by weight, in particular from
20 to 90% by weight, of an oxidic support, and the product mixture removed from
30 the first hydrogenation stage being introduced without further purification into the
second hydrogenation stage.